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BRITISH
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A Reconnaissance Survey of Unnamed Lake (Lake D11,000)

K. Mathias
March 1997

PWFWCP Report No. 163

105-02090/

The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave. 3rd Floor, Prince George B.C. V2L 3H9

Website: *www.bchydro.bc.ca/environment/initiatives/pwcp/*

This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

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A RECONNAISSANCE SURVEY OF

UNNAMED LAKE (LAKE D11,000)

WATERSHED:	**Finlay River**
DATE OF SURVEY:	**September 14-15,1996**
FIELD CREW LEADER:	**Mark Hunter**
FIELD ASSISTANT:	**Karin Mathias**
REPORT PREPARED BY:	**Karin Mathias**
REPORT EDITTED BY:	**Mark Hunter**

BRITISH COLUMBIA CONSERVATION FOUNDATION

PEACE / WILLISTON FISH AND WILDLIFE COMPENSATION PROGRAM

B. C. MINISTRY OF ENVIRONMENT, LANDS AND PARKS

FUNDED BY: FOREST RENEWAL BRITISH COLUMBIA

RELEASED BY: _____

D. J. Cadden, Regional Fisheries Biologist

LAKE: Unnamed Lake (Lake D11,000) SYSTEM NAME: Finlay River

A.S.A.P. REFERENCE NO.: **WATERSHED CODE: 230-9487**

DATA ON FILE FOR THIS SURVEY

Location	X	Dissolved 02 / Temp. Profiles	X
Physical Data	X	Winter Dissolved $_{02}$ / Temp. Profiles	--
Bench Mark	X	Netting Record	X
Terrain Features	X	Lake Catch Summary	X
Access	X	Individual Fish Data	--
Resorts and Campsites	X	Fish Preserved	--
Other Developments	X	Stomach Analysis	--
Obstructions and Pollutions	X	Scale Reading	--
Special Restrictions	X	Location of Inventory Sites	X
Aquatic Plants	X	Photograph Directory	X
Wildlife Observations	X	Appendices	
Miscellaneous Comments	X	A: Water Chemistry Analysis	X
Lake Drainage	X	B: Tributary Stream Data	X
Fisheries Management Comments	X	C: Fish Scale Analysis	--
History of Previous Surveys	X-	Bathymetric Map Reduction	X
Water Chemistry Summary	X	Bathymetric Map	--

LOCATION

Location:	approximately 133 km north-northwest of Mackenzie.		
Elevation:	825 m ± 25 m	U.T.M.:	10.423610.6244365
Latitude / Longitude:	56°20'16" 124°14'08"	N.T.S. Map No.:	94 C/8 edition 2
Management Unit:	7-37	Biogeoclimatic Zone:	Sub-Boreal Spruce
Ecoprovince:	Sub-Boreal Interior	Ecoregion:	Central Canadian Rocky Mountains
Ecosection:	Misinchinka Ranges		

Drainage: Unnamed C. --> Unnamed P. --> Unnamed P --> Unnamed L. --> Unnamed P.
Williston Reservoir (Finlay Reach) --> Peace R.

PHYSICAL DATA

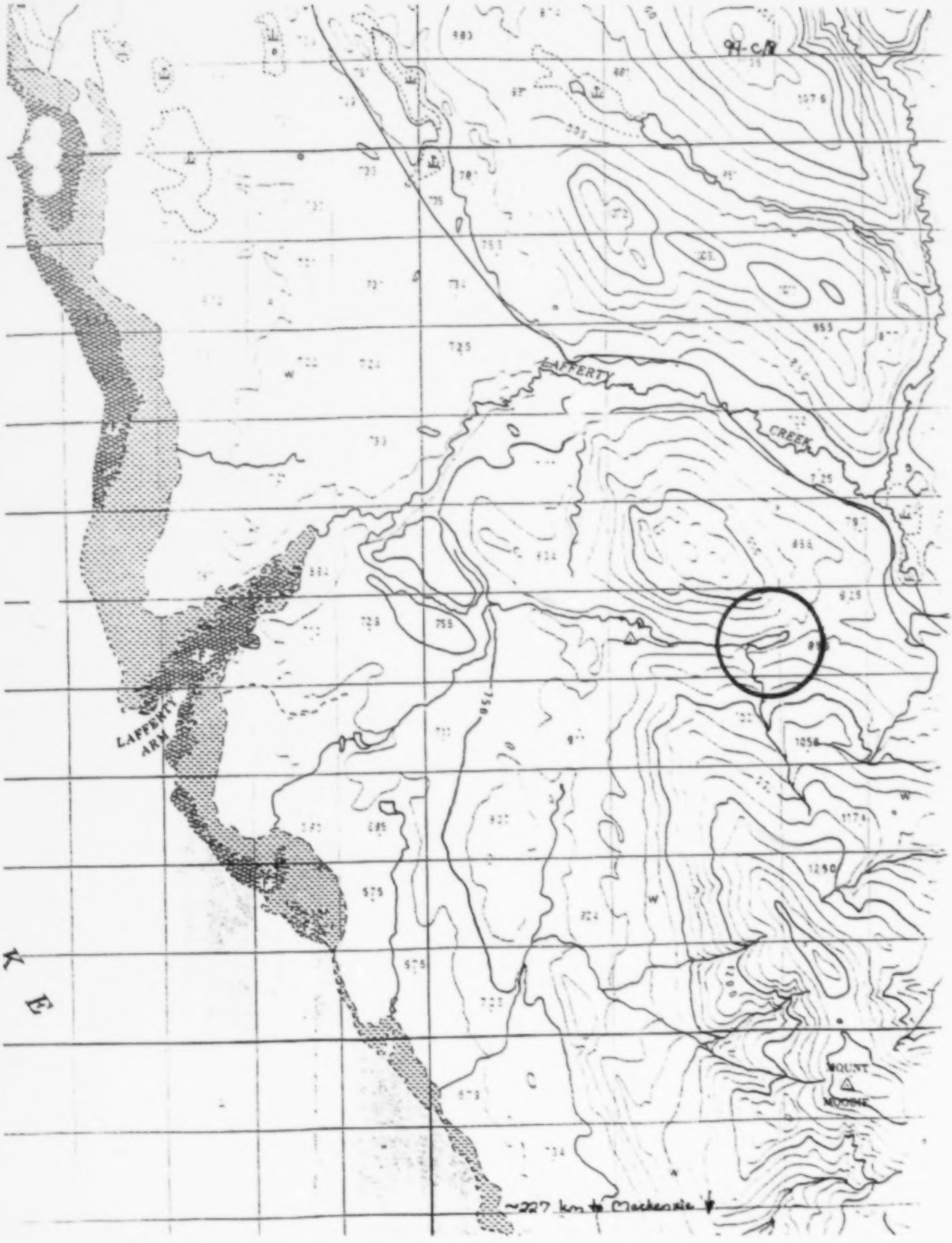
Lake Drainage Area:	1.5 km^2	Volume:	132 296 m'
Water Surface Area:	59 861 m^2	Perimeter of Islands:	0 m
Area Above 6 m Contour:	53 502 m^2	Number of Islands:	0
Shoreline Perimeter:	13591n	Mean Depth:	2.3 m
Maximum Depth:	7.2 m	Secchi Reading:	6.7 m
Filterable Residue (TDS):	180 mg/L		

Sounding Device: Lowrance X-15 Elevation Source: Contour Interpolation

BENCHMARK

(Iron spike, center of red circle) located 2.0 m above present water level in a 23 cm diameter spruce tree that is 3.8 m from the present water's edge, located on the north side of the lake, approximately 100 m northeast of the outlet (Plate T 3).

High Water Mark: 0.15 m above water level at time of survey


LAFFERTY
CREEK
LAFFERTY ARM
MOUNT MOORE
~227 km to Mackenzie

LAKE: Unnamed Lake (Lake D11,000)

TERRAIN FEATURES

Immediate Shoreline:

The shoreline slope of Lake D11,000 is moderately steep to steep on the north and south sides of the lake. The shore is low sloped to the east and west ends of the lake. On the steep north and south sides, the lake is fronted by sedge grasses, alder, highbush-cranberry, devil's club, huckleberry, bunchberry, and some juniper, which is backed by a forest of spruce, fir, lodgepole pine, and paper birch trees. The low wetland area at the east end of the lake, is fronted by sedge grasses and *Equisetum* sp., and backed by spruce trees. The riparian vegetation to the low west end of the lake, adjacent to the outlet, consists of abundant devil's club, alder, paper birch, black cottonwood, trembling aspen and the occasional fir tree. Around the whole shoreline of Lake D11,000, there is abundant blow down, potentially hindering boat movement in some areas.

The shoreline substrate consists of fines and organics over gravels on the north and south sides of the lake, and of silts and organics to the east and west ends of Lake D11,000. The lake bottom has a moderately steep slope along the north and south shores towards the center of the lake, and a moderately low slope from the east and west ends of the lake.

Surrounding Country:

Lake D11,000 is surrounded by a mature forest of spruce, fir, lodgepole pine, and paper birch trees. Steep, rolling hills are located to the north of Lake Dl 1,000. The area to the east of Lake Dl 1,000 is low with rolling hills visible in the distance. The land is also low to the west, with no hills visible from the lake in that direction. A gravel logging road, the Dl 1,000 Road, is located approximately 150 m up from the steep south side of the lake. A cut block is located on steep, rolling hills to the southeast of Lake Dl 1,000 on the other side of the D11,000 Road. Lake Dl 1,000 is situated within the Sub-Boreal Spruce biogeoclimatic zone.

LAKE: Unnamed Lake (Lake D11,000)

ACCESS

Directions:

From the junction of the Finlay-Davis Forest Service Road and the Finlay-Ospika Forest Service Road (just north of Ospika Camp - operated by Timber West Forest Ltd.), drive for approximately 11.5 km on the Finlay-Davis Forest Service Road. Turn left on to the DI 1,000 Road, and proceed for approximately 2.0 km. Lake DI 1,000 is located approximately 0.15 Ian north of the road. Gear can be hauled into the lake near the west end where the slope down to the lake is lower. From Ospika Camp, the total distance to Lake D11,000 is approximately 13.5 km.

This area has no direct access by road. To reach Ospika Camp, the truck and gear must be barged up out of Mackenzie by Finlay Navigation Inc. They can be reached at (250) 964-3525 in Prince George or at (250) 997-3525 in Mackenzie. The crew must be flown up on one of the local airlines as no passengers are allowed to travel on the barge. At the time of the survey, the barge left Mackenzie on Tuesday and Friday at approximately 1800 hrs, and docked at the Ospika Landing (located approximately 1.0 km south of Ospika Camp) at approximately 0200 hrs the next morning.

Road Type and Conditions:

The Finlay-Davis Forest Service Road and the D11,000 Road both well-maintained, two lane gravel roads that are easily traveled with a two-wheel drive vehicle during the summer.

Restrictions:

Although there are no restrictions, it is recommended that a truck radio be used when traveling the gravel roads.

RESORTS AND CAMPSITES

There were no resorts or campsites on Lake D11,000 at the time of survey.

OTHER DEVELOPMENTS

An old wooden dock was located near Inlet #1 at the east end of Lake D11,000.

LAKE: Unnamed Lake (Lake D11,00)

OBSTRUCTIONS AND POLLUTIONS

None noted.

SPECIAL RESTRICTIONS

None known.

AQUATIC PLANTS

The following aquatic plants were identified in Lake D11,000 during the time of survey:

Chara sp.
marestail (Hippuris sp.)
yellow waterlily *(Nuphar* sp.)
Equisetum sp.
claspingleaf pondweed *(Potamogeton richardsonii)*
sedge grasses
smartweed *(Polygonum sp.)*
milfoil (Myriophyllum sp.)
eel grass

WILDLIFE OBSERVATIONS

The following wildlife or wildlife signs were seen/heard during the time of the survey:
cow and calf moose; moose tracks
2 ducks (unidentified)
muskrat
snipe

MISCELLANEOUS COMMENTS

1) Bathymetric map: The lake outline was drawn from an enlargement of air photo 30 BCB 93065: No. 065, flown on August 18, 1993.

2) Many of the distances given in the directions to Lake D11,000 (in the Access section) have been taken from Forest Cover maps and thus distances are approximations only.

3) The following aquatic organism(s) were observed in abundance in Lake D11,000:
- large predaceous water beetle
- *Gammerus sp.* shrimp
- copepods

LAKE: Unnamed Lake (Lake D11,00)

LAKE DRAINAGE

General:

Two inlets feed Lake D11,000 at the east end of the lake. The lake is drained to the west by an unnamed creek that flows for 1.5 km to an unnamed pond. The unnamed outlet of the pond flows 0.2 km to another unnamed pond. The unnamed outlet of this pond flows 3.9 km before it enters an unnamed lake. The lake's unnamed outlet flows approximately 0.1 km to an unnamed pond. The unnamed outlet of this pond flows for 1.4 km before reaching the Finlay Reach of the Williston Reservoir. All distances are approximations.

Major Systems:

There are no major systems.

Minor Systems:

Inlet # 1 - Unnamed Creek

Inlet # 1 enters Lake D11,000 in the east end (Plate # 5). From the mouth of Inlet # 1 to 20 m upstream of the lake, the average wetted width is 0.5 m and the average depth is 0.05 m. The inlet banks are approximately 0.05 m high and grown over with moss and sedge grasses. The inlet substrate consist of rust-colored organics. A beaver dam, 0.35 m in height and 5.0 m in length, is situated approximately 20 m upstream of Lake D11,000. Inlet # 1 did not flow over the beaver dam at the time of survey. The inlet channel goes underground approximately 30 m upstream of the lake. Inlet # 1 had no fisheries potential during the survey period.

Inlet # 2 - Unnamed Creek

Inlet # 2 enters Lake D11,000 on the south shore, at the east end of the lake (Plate # 6). The inlet goes underground approximately 10 m upstream of the lake. The average wetted width of Inlet # 2 is 0.3 m and the average depth is 0.05 m. The first 5 m of the inlet has an organic substrate, whereas the last 5 m of the inlet is steeper and has a substrate of cobbles and boulders. Seven blown down trees cross the channel of Inlet # 2. Inlet # 2 had no fisheries potential during the survey period.

Outlet - Unnamed Creek

The outlet creek drains Lake Dl 1,000 at the west end of the lake over beaver dam # 1 (Plate # 7 & # 8). Beaver dam # 1 is 1.4 m high and 30 m long. There was very little flow over the top of the dam at the time of survey, thus likely obstructing the upstream

movement of fish. There is a second beaver dam located approximately 12 m downstream of the lake which is 0.8 m high and 15 m long. There was some flow over the top of beaver dam # 2, which was likely passable to small fish at the time of survey. Beaver dam # 3, located approximately 30 m downstream of Lake D11,000, is 0.5 m high and 15 m long. Water could be heard flowing through the dam, but insufficient flow over the dam probably made it impassable to the upstream movement of fish at the time of survey. Beaver dam # 4, located approximately 42 m downstream of the lake, is 1.3 m high and 8 m long. Two channels flowed past the dam; the first flows over the top, drops 1.3 m to the channel and then dries up quickly. The second channel flows through a small breach in the dam, and has an average wetted width of 0.3 m, a maximum depth of 0.05 m, and a substrate of silt and organics. This channel dries up approximately 55 m downstream of the lake.

A pond is formed between each beaver dam on the outlet creek. These ponds are all small, have silt and organic substrates, and have moderate amounts of large woody debris in them. A small creek, located approximately 75 m downstream of Lake Dl 1,000, flows into the dry outlet creek bed. This creek has an average wetted width of 1.0 m and a maximum depth of 0.05 m. This creek becomes quite steep quickly, and has a substrate of small gravel with abundant small woody debris over top. Neither the outlet creek, nor the inlet to the outlet, had any fisheries potential during the survey period.

LAKE: Unnamed Lake (Lake D11,00)

FISHERIES MANAGEMENT COMMENTS

Lake D 11,000 is believed to be barren of all fish species. No fish were captured in one experimental monofilament gill net and four minnow traps set overnight. The two continuous inlets entering Lake D11,000, as well as the outlet creek, had no spawning potential. At the time of survey, food items suitable for salmonids, such as dragonfly nymphs, large predaceous water beetles, *Gammerus* and copepods, were observed. The maximum depth of Lake D11,000 is 7.2 m, and the temperature / oxygen profile recorded at the time of survey indicates that the dissolved oxygen levels at the time of survey were sufficient to support a fish population. The pH, which averaged 8.1 from the surface to the bottom, is also suitable for the survival of salmonid species. However, the abundance of blow down around this small lake detracts from it's aesthetic value and may make sport fishing difficult. If Lake Dl 1,000 was utilized to create a sport fishery, it would have to be stocked regularly due to the lack of suitable salmonid spawning habitat.

HISTORY OF PREVIOUS SURVEYS

Lake Surveys:

None known.

Other Related Studies:

None known.

LAKE: Unnamed Lake (Lake D11,000)

WATER CHEMISTRY SUMMARY **Limnology Station No. 1**

Field Conditions:

Date:	September 15, 1996		
Time:	1100 hrs	Air Temperature:	11.5°C
Wind Velocity:	0 km/h	Wind Direction:	N/A
Cloud Cover:	4/10 o.c.	Surface Conditions:	calm
Secchi Disc:	6.7 m	Water Colour:	green/yellow; slightly cloudy

Method Used:

Dissolved Oxygen:	YSI Model 58 Oxygen / Temperature Meter
Water Temperature:	YSI Model 58 Oxygen / Temperature Meter
Air Temperature:	Hand-Held Alcohol Thermometer
pH (field):	Digital pH Pocket Tester
H_2S (field):	Hach H_2S Field Test Kit
Laboratory Used:	Pacific Environmental Science Center
Water Sampler:	Vertical Alpha Water Bottle (Vandorn)
Metal Sampler:	By Hand; Preserved With 2.0 mL Nitric Acid
Substrate Sampler:	Substrate Sample Not Taken

Water Sample Chemistry: **SEAM Site No.: E223153**

	Sampling Depths	
	Surface (0.5 m)	Lower (6.0 m)
Alkalinity (lab)	151 mg/L	151 mg/L
Filterable Residue 105°C (lab)	180 mg/L	180 mg/L
H_2S (field)	N/A	0.0 mg/L
Nitrogen - Total (lab)	0.36 mg/L	0.41 mg/L
Non-Filterable Residue (lab)	< 5 mg/L	< 5 mg/L
pH (field)	8.4	7.8
pH (lab)	8.1	8.1
Phosphorus - Total Dissolved (lab)	0.006 mg/L	0.006 mg/L
Specific Conductance (lab)	288 uS/cm	288 uS/cm

Bottom Depth: 6.7 m

Substrate Sample Depth: N/A (substrate was silt/organics)

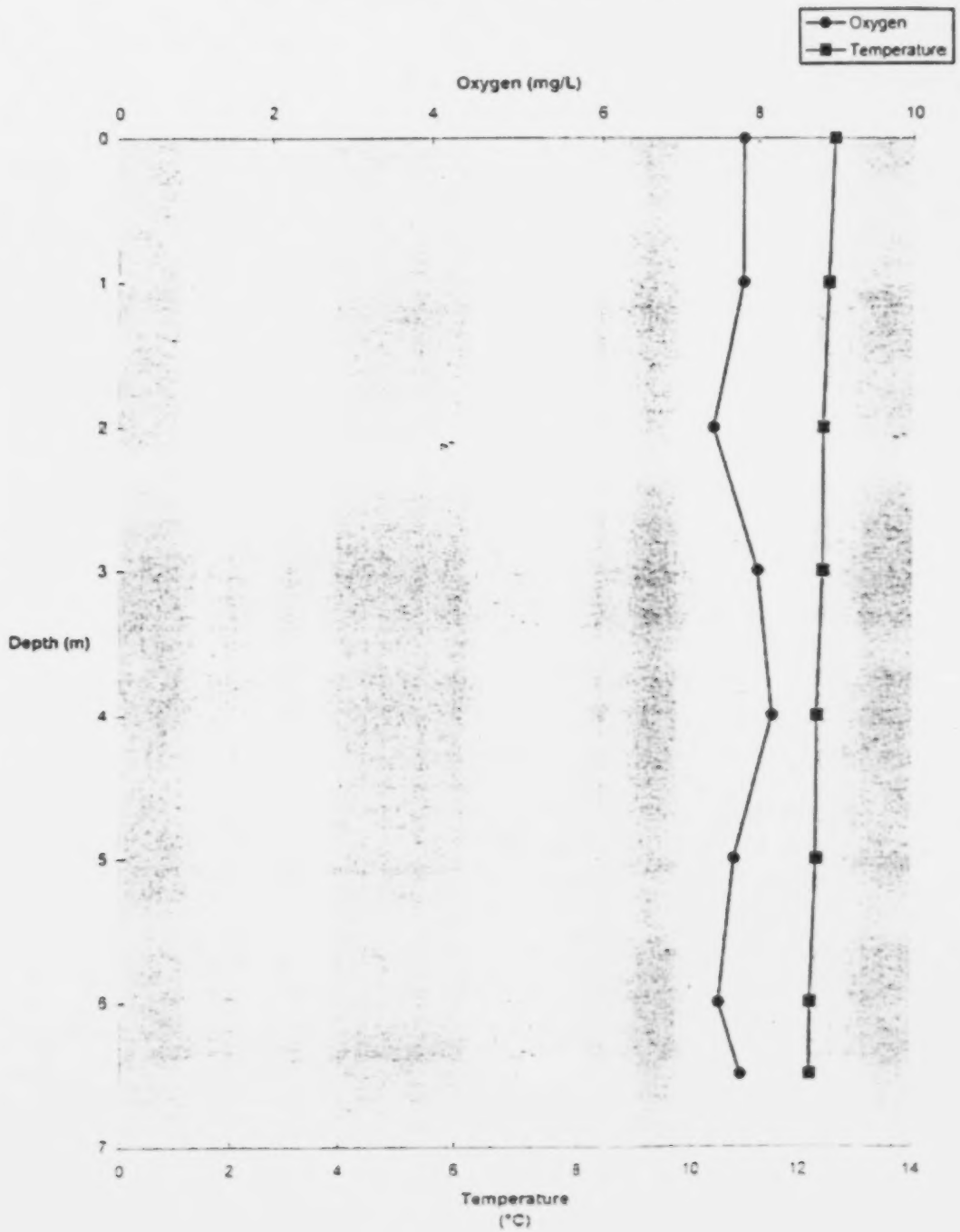
* additional analyzed parameters and results, including metals, are found in Appendix A

LAKE: Unnamed Lake (Lake D11,000)

SUMMER OXYGEN / TEMPERATURE DATA

DEPTH (m)	02 (mg/L)	TEMPERATURE (°C)
Surface	7.8	12.6
1.0	7.8	12.5
2.0	7.4	12.4
3.0	8.0	12.4
4.0	8.2	12.3
5.0	7.7	12.3
6.0	7.5	12.2
6.5	7.8	12.2
6.7	Bottom	

SUMMER OXYGEN / TEMPERATURE PROFILE



LAKE: Unnamed Lake (Lake D11,00)

NETTING RECORD

Mesh Size Experimental Order: 25, 76, 51, 89, 38, 64 mm

NETTING SITE # 1

Type:	Sinking Monofilament Gill Net			
Date Set:	September 14, 1996		Time:	1702 hrs
Date Lifted:	September 15, 1996		Time:	0905 hrs
Net Dimensions:	Length:	91.4 m	Depth:	2.4 m
Shallow End Mesh Size:	25 mm		Depth:	1.0 m
			Substrate:	Chara over organics
Deep End Mesh Size:	64 mm		Depth:	1.0 m
			Substrate:	Chara over organics

Comments:

The net started approximately 4.5 m out from the south shore and ended approximately 10.0 m from the opposite shore.

LAKE CATCH SUMMARY

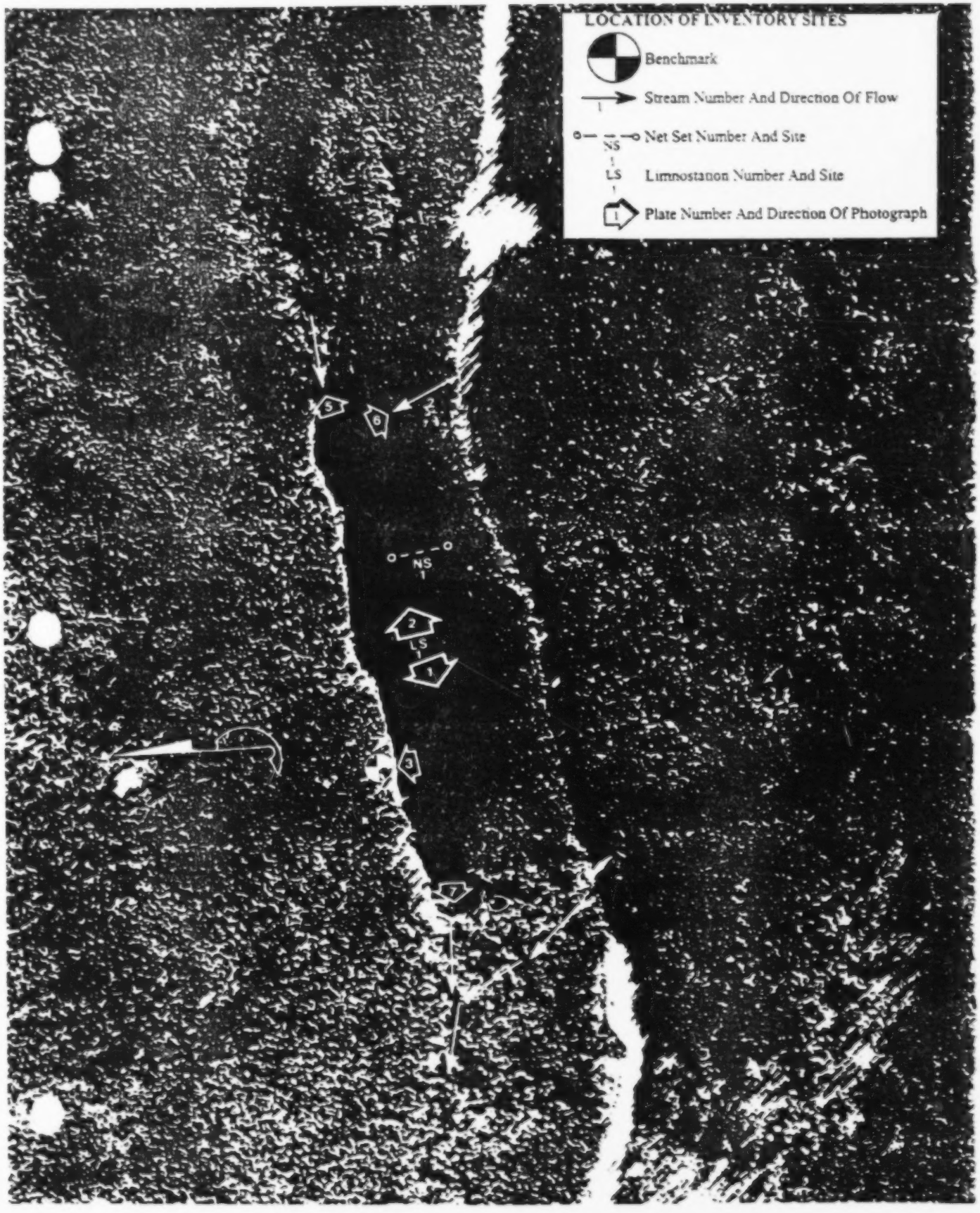
Species	Netting Site No. 1	Angled	Other	Total	Number Sampled	Number Preserved	Size Range (cm)
None	0	0	0	0	0	0	N/A

MINNOW TRAPS:

Bait: Sardines

Trap No.	Hours	Depth (m)	Substrate	Species	No. Caught	Size Range (cm)
1	16:02	1.3	Chara over organics	Dragonfly nymph Beetle	1 1	-
2	16:04	0.9	Marestail (Hippuris sp.) over organics	Beetle	17	-
3	16:05	0.9	silt/organics	Beetle Leech	62 2	-
4	16:02	0.6	silt/organics	Beetle Leech	70 1	-

Comments: The beetle caught in the minnow traps were predacious water beetles, approximately 2 cm long and 1 cm wide, and dark brown in color. One type had a solid brown black, the other type (otherwise similar) had a lengthwise striped back.


LOCATION OF INVENTORY SITES
Benchmark
Stream Number And Direction Of Flow
NS
Net Set Number And Site
LS
Limnostation Number And Site
Plate Number And Direction Of Photograph
5
6
NS
2
LS
1
3
7

LAKE: Unnamed Lake (Lake D11,000)

PHOTOGRAPH DIRECTORY

Plate	Roll : Number	Description
1	29: 8-9	Panoramic view of Lake D11,000 looking west, taken from the center of the lake.
2	29: 5-6	Panoramic view of Lake D11,000 looking east, taken from the center of the lake.
3	29: 14	View of the benchmark located 2.0 m above the present water level, situated on a 23 cm diameter spruce tree, 3.8 m from the present shoreline, and located on the north shore, approximately 100 m northeast of the outlet.
4	29: 11	View of the beaver hut located off the south shore near the west end of Lake D11,000.
5	29: 13	View of the mouth of Inlet #1 where it enters Lake D11,000 at the east end of the lake.
6	29: 12	View of the mouth of Inlet #2 where it enters Lake Dl 1,000 on the south shore at the east end of the lake.
7	29: 15	View of the mouth of the outlet where it drains over beaver dam #1, taken from out on Lake D11,000.
8	29: 16	Upstream view of beaver dam #1 on the outlet, located at the edge of Lake D11,000. Dam height is 1.4 m.

LAKE: Unnamed Lake (Lake DH1,000)

Plate # 1: Panoramic view of Lake DH1,000 looking west, taken from the center of the lake

LAKE: Unnamed Lake (Lake D11,000)

Plate # 2: Panoramic view of Lake D11,000 looking east, taken from the center of the lake

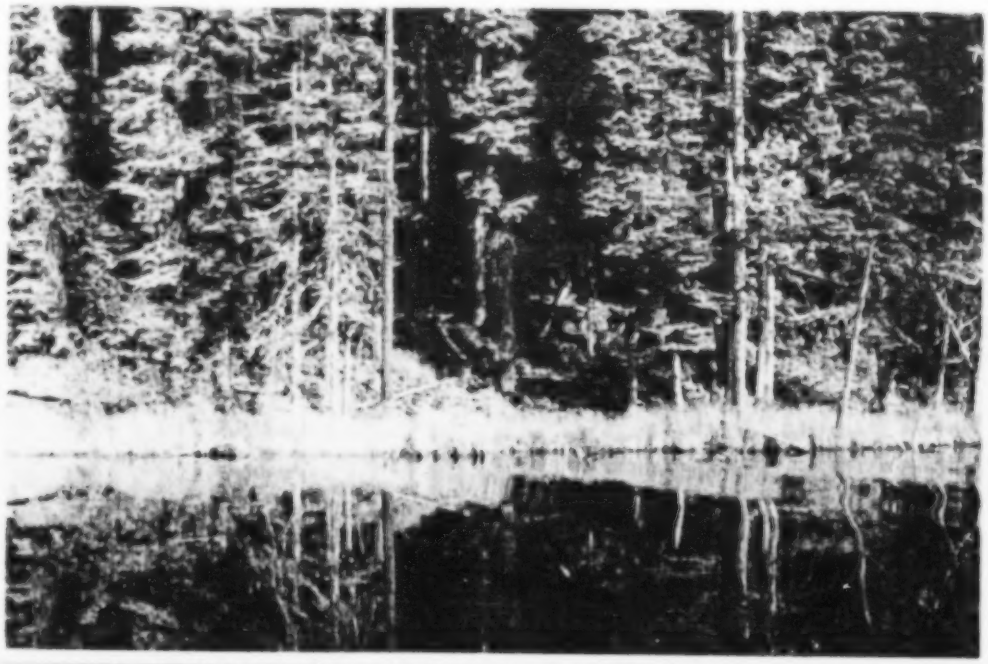


Plate # 3: View of the benchmark located 2.0 m above the present water level, situated on a 23 cm diameter spruce tree, 3.8 m from the present shoreline, and located on the north shore, approximately 100 m northeast of the Outlet Creek.

Plate # 4: View of the beaver but located off the south shore near the west end of Lake D 11,000.

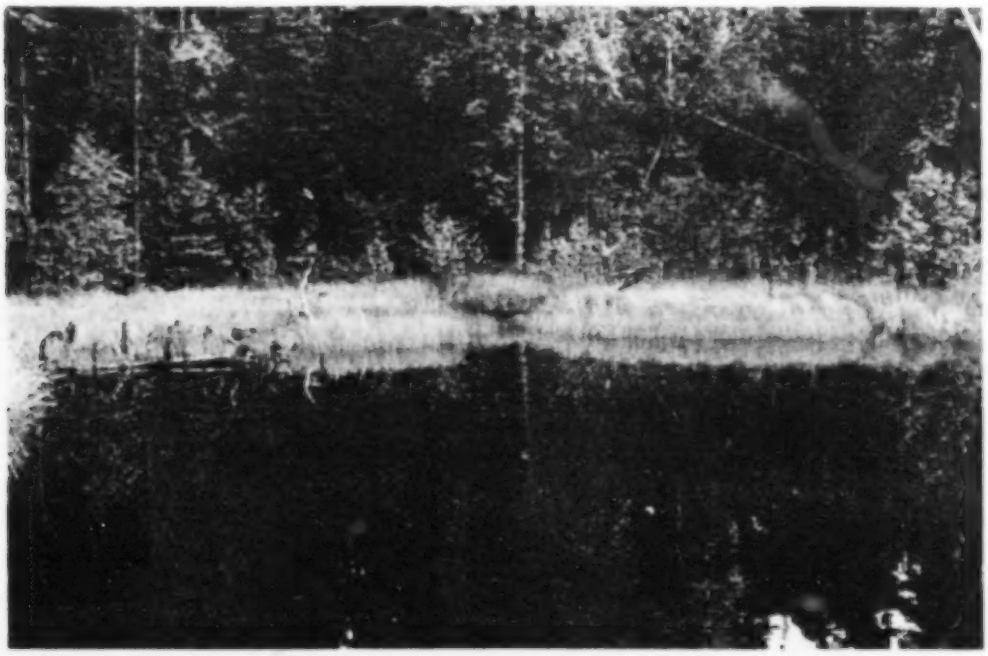


Plate # 5: View of the mouth of Inlet # 1 where it enters Lake D 11,000 at the east end of the lake.

Plate # 6: View of the mouth of Inlet # 2 where it enters Lake D 11,000 on the south shore at the east end of the lake.

LAKE: Unnamed Lake (Lake Dl 1,000)

Plate # 7: View of the mouth of the Outlet Creek where it drains over beaver dam # 1, taken from out on Lake D 11,000.

Plate # 8: Upstream view of beaver dam == I on the Outlet Creek, located at the edge of Lake D 11,000. Dam height is 1.4 in.

Appendix A

LABORATORY REPORT

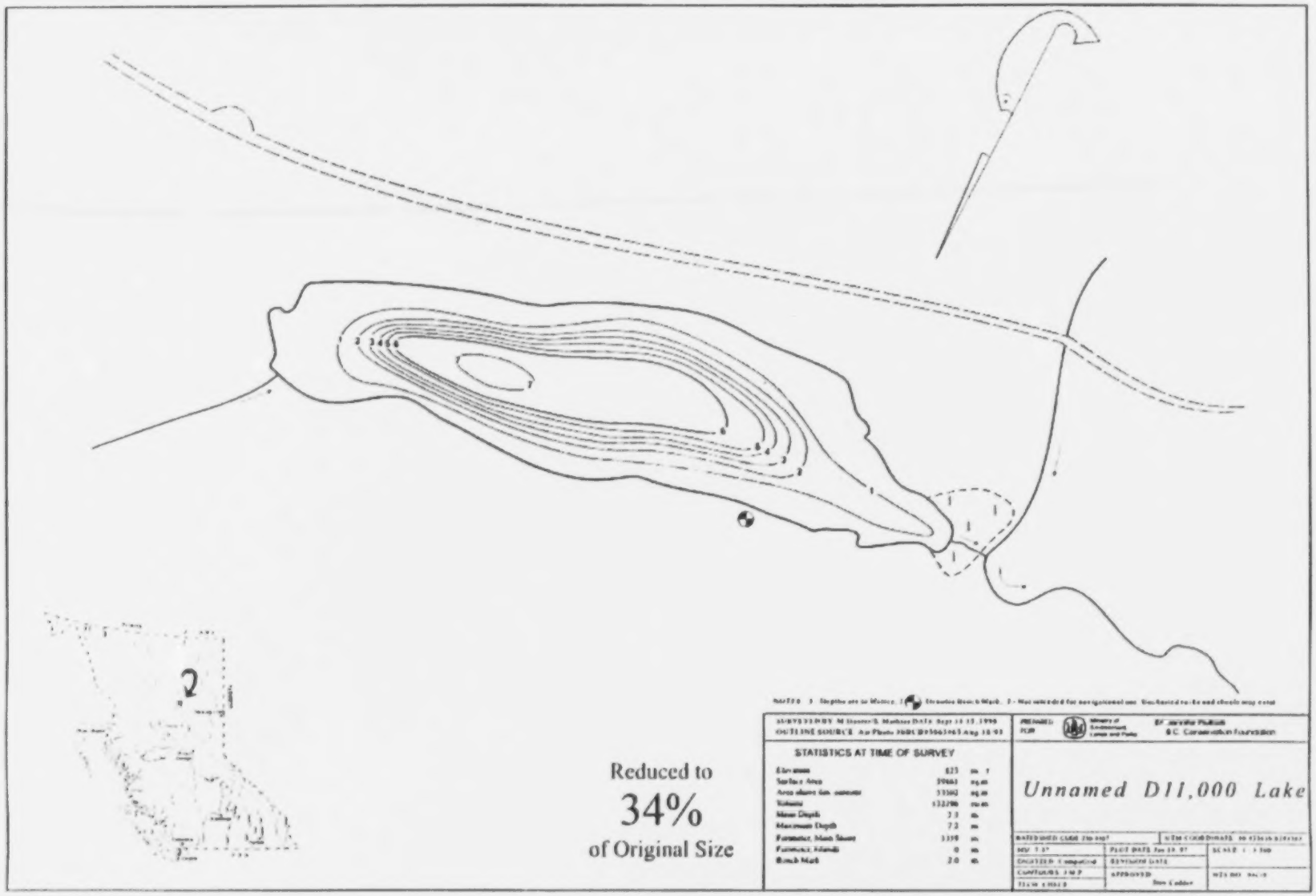
Water Chemistry Analysis

RESULTS FOR UNNAMED LK-D11,000 SAMPLES

Parameter Analyzed		Units	964994-001	964994-002
ALKALINITY		mg/l	151	151
CONDUCTIVITY		uS/cm	288	288
METALS/TOTAL (WATER-ICP)	AG	mg/l	<.01	-
	AL	mg/l	<.06	-
	AS	mg/l	<.06	-
	B	mg/l	<.01	-
	BA	mg/l	.016	-
	BE	mg/l	.001	-
	CA	mg/l	32.1	-
	CD	mg/l	<.006	-
	CO	mg/l	<.006	-
	CR	mg/l	.01	-
	CU	mg/l	<.006	-
	FE	mg/l	.067	-
	K	mg/l	.3	-
	MG	mg/l	17.6	-
	MN	mg/l	.017	-
	MO	mg/l	<.01	-
	NA	mg/l	2.5	-
	NI	mg/l	<.02	-
	P	mg/l	<.1	-
	PB	mg/l	<.06	-
	SB	mg/l	<.06	-
	SE	mg/l	<.06	-
	SI	mg/l	1.7	-
	SN	mg/l	<.06	-
	SR	mg/l	.314	-
	TI	mg/l	<.002	-
	V	mg/l	<.01	-
	ZN	mg/l	<.002	-
NITROGEN/AMMONIA		mg/l	.037	.034
/NITRITE		mg/l	.003	<.002
/NITRITE+NITRATE		mg/l	.006	.005
/TOTAL		mg/l	.36	.41
PH		Rel.U.	8.12	8.11
PHOSPHORUS/O-PO4		mg/l	<.001	<.001
/TOTAL		mg/l	.006	.006
/TOTAL DISSOLVED		mg/l	.006	.006
RESIDUE/FILTERABLE		mg/l	180	180
/NON-FILTERABLE		mg/l	<5	<5
BC CLIENT STUDY CODE			20	20
SAMPLING AGENCY		EMScode	91	91
SITE IDENTIFIER/NUMBER			E223153	E223153
COLLECTION START DATE		y/m/d	96/09/15	96/09/15
UPPER DEPTH		metres	0.5	6
TEMPERATURE ON ARRIVAL		deg.C	6	6

Appendix B

BATHYMETRIC MAP



Reduced to
34%
of Original Size

STATISTICS AT TIME OF SURVEY		
Elevation	823	m ?
Surface Area	39661	sq.m
Area above ice contour	33360	sq.m
Volume	132798	cu.m
Mean Depth	3.3	m
Maximum Depth	7.3	m
Perimeter, Mean Shore	1339	m
Perimeter, Islands	0	m
Bomb Mark	2.0	m

Unnamed D11,000 Lake